BOARD QUESTION PAPER: MARCH 2025

Mathematics Part - II

Time: 2 Hours **Max. Marks: 40**

Note:

i. *All* questions are compulsory.
ii. Use of a calculator is not allowed.
iii. The numbers to the right of the questions indicate full marks.
iv. In case of MCQs [Q. No. **1(A)**] only the first attempt will be evaluated and will be given credit.
v. Draw proper figures wherever necessary.
vi. The marks of construction should be clear. Do not erase them.
vii. Diagram is essential for writing the proof of the theorem.

Q.1. (A) Choose the correct alternative from given: **[4]**

i. Out of the following which is a Pythagorean triplet?
(A) (1, 5, 10) (B) (3, 4, 5)
(C) (2, 2, 2) (D) (5, 5, 2)

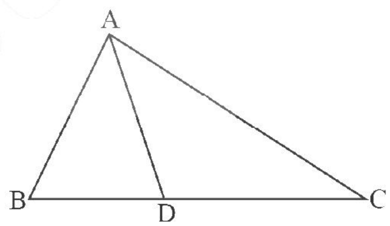
ii. $\angle ACB$ is inscribed angle in a circle with centre O. If $\angle ACB = 65°$, then what is measure of its intercepted arc AXB?
(A) 65° (B) 230°
(C) 295° (D) 130°

iii. Distance of point (3, 4) from the origin is ______.
(A) 7 (B) 1
(C) 5 (D) –5

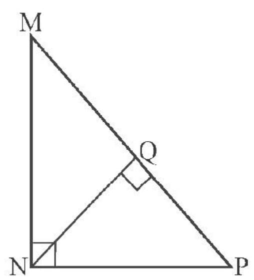
iv. If radius of cone is 5 cm and its perpendicular height is 12 cm, then the slant height is ______.
(A) 17 cm (B) 4 cm
(C) 13 cm (D) 60 cm

(B) Solve the following sub-questions: **[4]**

i. In the following figure ΔABC, B – D – C and BD = 7, BC = 20, then find $\frac{A(\Delta ABD)}{A(\Delta ABC)}$.



ii. In the following figure $\angle MNP = 90°$, seg NQ $\perp$ seg MP, MQ = 9, QP = 4, find NQ.



iii. Angle made by a line with the positive direction of X-axis is 30°.Find slope of that line.

Q.2. (A) Complete the following activities and rewrite it *(any two)*: **[4]**

i. The radius of a circle with centre 'P' is 10 cm. If chord AB of the circle subtends a right angle at P, find area of minor sector by using the following activity. ($\pi = 3.14$)

Activity:

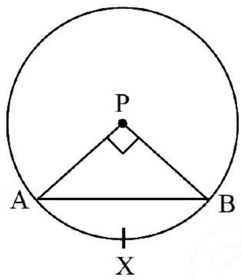
$r = 10$ cm, $\theta = 90°$, $\pi = 3.14$.

$A(P\text{–}AXB) = \dfrac{\theta}{360} \times \square$

$= \dfrac{\square}{360} \times 3.14 \times 10^2$

$= \dfrac{1}{4} \times \square$

$A(P\text{–}AXB) = \square$ sq.cm.



ii. In the following figure chord MN and chord RS intersect at point D. If RD = 15, DS = 4, MD = 8, find DN by completing the following activity:

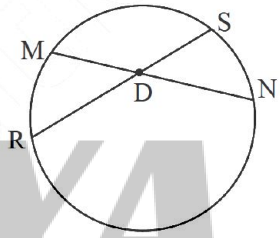
Activity:

$\therefore$ $MD \times DN = \square \times DS$ ...(Theorem of internal division of chords)

$\therefore$ $\square \times DN = 15 \times 4$

$\therefore$ $DN = \dfrac{\square}{8}$

$\therefore$ $DN = \square$



iii. An observer at a distance of 10 m from tree looks at the top of the tree, the angle of elevation is 60°. To find the height of tree complete the activity. $(\sqrt{3} = 1.73)$

Activity:

In the figure given, AB = h = height of tree, BC = 10 m, distance of the observer from the tree.

Angle of elevation (θ) = $\angle BCA = 60°$

$\tan\theta = \dfrac{\square}{BC}$ ...(i)

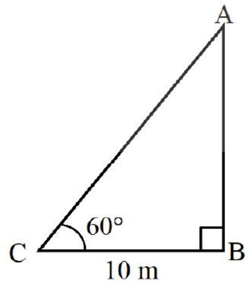
$\tan 60° = \square$ ...(ii)

$\dfrac{AB}{BC} = \sqrt{3}$ ...[from (i) and (ii)]

$AB = BC \times \sqrt{3} = 10\sqrt{3}$

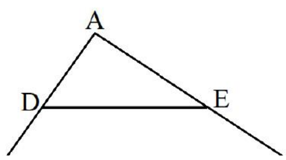
$AB = 10 \times 1.73 = \square$

$\therefore$ height of the tree is $\square$ m.

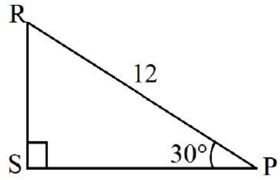


(B) Solve the following sub-questions *(any four)*: **[8]**

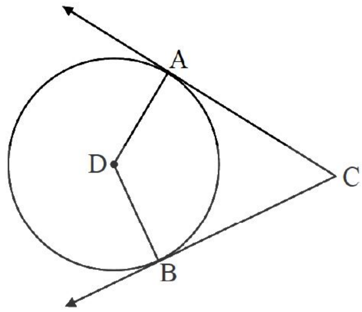
i. In ΔABC, DE || BC. If DB = 5.4 cm, AD = 1.8 cm, EC = 7.2 cm, then find AE.



ii. In the figure given below, find RS and PS using the information given in ΔPSR.



iii. In the following figure, circle with centre D touches the sides of ∠ACB at A and B. If ∠ACB = 52°, find measure of ∠ADB.

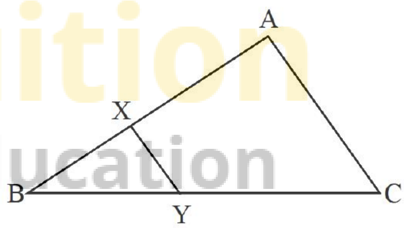


iv. Verify, whether points, A(1, –3), B(2, –5) and C(–4, 7) are collinear or not.

v. If $\sin \theta = \frac{11}{61}$, find the values of cos θ using trigonometric identity.

Q.3. (A) Complete the following activities and rewrite it *(any one)*: **[3]**

i. In the following figure, XY || seg AC. If 2AX = 3BX and XY = 9. Complete the activity to find the value of AC.



Activity:

2AX = 3BX …[Given]

∴ $\frac{AX}{BX} = \frac{3}{\square}$

$\frac{AX+BX}{BX} = \frac{3+2}{2}$ …[by componendo]

$\frac{\square}{BX} = \frac{5}{2}$ …(i)

Now ΔBCA ~ ΔBYX …[$\square$ test of similarity]

∴ $\frac{BA}{BX} = \frac{AC}{XY}$ …[corresponding sides of similar triangles]

$\frac{\square}{\square} = \frac{AC}{9}$ …[from (i)]

∴ AC = $\square$

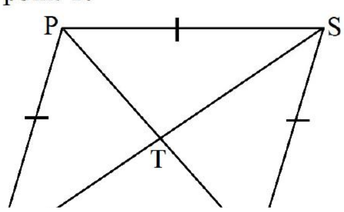
ii. Complete the following activity to prove that the sum of squares of diagonals of a rhombus is equal to the sum of the squares of the sides.

Given:

□PQRS is a rhombus. Diagonals PR and SQ intersect each other at point T.

To prove:

$PS^2 + SR^2 + QR^2 + PQ^2 = PR^2 + QS^2$



Activity:

Diagonals of a rhombus bisect each other.

In ΔPQS, PT is the median and in ΔQRS, RT is the median.

∴ by Apollonius theorem,

$QR^2 + SR^2 = \boxed{\quad\quad} + 2QT^2$ …(ii)

adding (i) and (ii),

$PQ^2 + PS^2 + QR^2 + SR^2$

$= 2(PT^2 + \boxed{\quad\quad}) + 4QT^2$

$= 2(PT^2 + \boxed{\quad\quad}) + 4QT^2$ …(RT = PT)

$= 4PT^2 + 4QT^2$

$= (\boxed{\quad\quad})^2 + (2QT)^2$

$\therefore$ $PQ^2 + PS^2 + QR^2 + SR^2 = PR^2 + \boxed{\quad\quad}$.

(B) Solve the following sub-questions (any *two*): **[6]**

i. Show that points P(1, – 2), Q(5, 2), R(3, – 1), S(– 1, – 5) are the vertices of a parallelogram.

ii. Prove that tangent segments drawn from an external point to a circle are congruent.

iii. Draw a circle with radius 4.1 cm. Construct tangents to the circle from a point at a distance 7.3 cm from the centre.

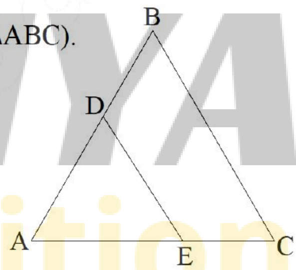
iv. How many solid cylinders of radius 10 cm and height 6 cm can be made by melting a solid sphere of radius 30 cm?

Q.4. Solve the following sub-questions (*any two*): **[8]**

i. In the following figure DE || BC, then:

a. If DE = 4 cm, BC = 8 cm, A(ΔADE) = 25 cm^2, find A (ΔABC).

b. If DE : BC = 3 : 5, then find A(ΔADE) : A(□DBCE).



ii. ΔABC ~ ΔPQR. In ΔABC, AB = 3.6 cm, BC = 4 cm and AC = 4.2 cm. The corresponding sides of ΔABC and ΔPQR are in the ratio 2 : 3, construct ΔABC and ΔPQR.

iii. The radii of the circular ends of a frustum of a cone are 14 cm and 8 cm. If the height of the frustum is 8 cm, find: ($\pi = 3.14$)

a. Curved surface area of frustum.

b. Total surface area of the frustum.

c. Volume of the frustum.

Q.5. Solve the following sub-questions (any *one*): **[3]**

i. □ABCD is a rectangle. Taking AD as a diameter, a semicircle AXD is drawn which intersects the diagonal BD at X. If AB = 12 cm, AD = 9 cm, then find the values of BD and BX.

ii. Taking $\theta = 30^\circ$ to verify the following Trigonometric identities:

a. $\sin^2\theta + \cos^2\theta = 1$

b. $1 + \tan^2\theta = \sec^2\theta$

c. $1 + \cot^2\theta = \text{cosec}^2\theta$.